

Objective: Fluently multiply multi-digit whole numbers using the standard algorithm and using estimation to check for reasonableness of the product.

MODULE 2 LESSON 8

FLUENCY – STATE IN EXPONENTIAL FORM NAME

- ✘ What is 10^2 and what is the answer?
 - + 10 squared or 10 to the 2nd power. The answer is 100.
- ✘ What is the base number and what is the exponent?
 - + Base number is 10 and the exponent is 2.
- ✘ What is the base number, exponent, how is it read, and what is the answer for the following problems?
- ✘ 10^3 , 10^4 , 10^5 , 2^2 , 2^3 , and 10^7
 - + 1,000, 10,000, 100,000, 4, 8, 10,000,000

FLUENCY – MULTIPLY USING THE AREA MODEL WITH A ZERO IN ONE FACTOR

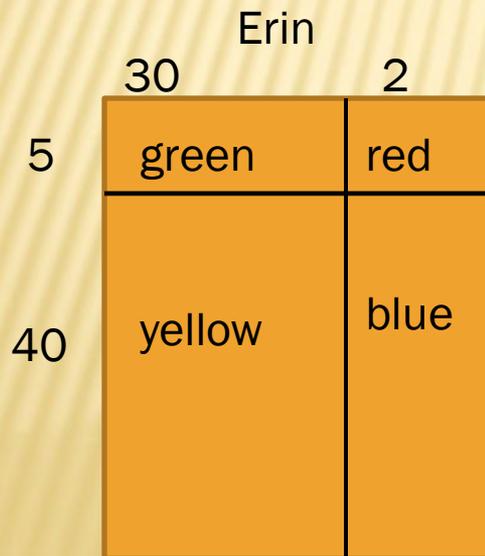
✘ 342×201

✘ 243×310

✘ 203×51

APPLICATION PROBLEM

- Erin and Frannie entered a rug design contest. The rules stated that the rug's dimensions must be 32 inches by 45 inches and that they must use rectangles. They drew the following for their entries. Show at least three other designs they could have entered in the contest, and calculate the area of each section and the total of your rugs.



CONCEPT DEVELOPMENT – PROBLEM 1

- ✘ 314×236
- ✘ Round each factor to the nearest hundreds.
- ✘ Find the product of the rounded numbers.
 - + $300 \times 200 = 60,000$
- ✘ Express your product as an expression with an exponent.
 - + 6×10^4
- ✘ Both factors were rounded down. Will our actual product be more than or less than our estimated product? Why?
 - + The answer should be more than 60,000. Our actual factors are greater, therefore our actual product will be greater than 60,000.

CONCEPT DEVELOPMENT – PROBLEM 1

- ✘ 314×236
- ✘ Solve the problem using the standard algorithm or area model. Compare your answer with a neighbor.
- ✘ What is the product?
 - + 74,104
- ✘ Is our answer reasonable?
 - + Yes because it is greater like we thought it would be.

CONCEPT DEVELOPMENT – PROBLEM 2

- ✘ $1,882 \times 296$
 - + Round each factor and estimate the product.
- ✘ What are our rounded numbers and the product.
 - + 2000 and 300 are the rounded numbers and the product is 600,000
- ✘ Will the actual product be greater than or less than the estimate? Why?
 - + Less than because we rounded both of the numbers up, so the estimated product will be more.

CONCEPT DEVELOPMENT – PROBLEM 2

- ✗ $1,882 \times 296$
- ✗ Find the product using the standard algorithm or area model.
 - + 557,072
- ✗ Does our answer seem reasonable?
 - + Yes because it is close to 600,000 but less than the estimate by a little bit.

CONCEPT DEVELOPMENT – PROBLEM 3

- ✘ $4,902 \times 408$
 - + Round each factor and estimate the product.
- ✘ What are our rounded numbers and the product.
 - + 5,000 and 400 are the rounded numbers and the product is 2,000,000
- ✘ Will the actual product be greater than or less than the estimate? Why?
 - + We can not fully tell because one number was rounded up and the other number was rounded down. The actual product should be close to 2,000,000 though.

CONCEPT DEVELOPMENT – PROBLEM 3

- ✘ $4,902 \times 408$
- ✘ Find the product using the standard algorithm or area model.
 - + 2,000,016
- ✘ Does our answer seem reasonable?
 - + Yes because it is close to 2,000,000.

PROBLEM SET

- ✘ Estimate the product first. Solve using the standard algorithm. Use your estimate to check for reasonableness of the product.

+ 213 x 328

807 x 491

+ 530 x 2,075

662 x 372

3,502 x 656

4,004 x 603

379 x 442

4,390 x 741

987 x 3,105

- ✘ Each container holds 1L 275 mL of water. How much water is in 609 identical containers? Find the difference between your estimated product and the precise product.

PROBLEM SET

- ✘ A club had some money to purchase new chairs. After buying 355 chairs at \$199 each, there was \$1,068 remaining. How much money did the club have at first?
- ✘ So far, Carmella has collected 14 boxes of baseball cards. Each box has 315 cards in it. Carmella estimates that she has about 3,000 cards, so she buys 6 albums that hold 500 cards each.
 - + Will the albums have enough space for all of her cards? Why or Why not?
 - + How many cards does Carmella have?
 - + How many albums will she need for all of her baseball cards?

EXIT TICKET

- ✘ Estimate the product first. Solve by using the standard algorithm. Use your estimate to check the reasonableness of the product.

$$+ 283 \times 416 = \underline{\hspace{2cm}}$$

$$+ 2,803 \times 406 = \underline{\hspace{2cm}}$$

HOMWORK

- ✘ Estimate the product first. Solve using the standard algorithm. Use your estimate to check for reasonableness of the product.

+ 312×149

743×295

428×637

+ 691×305

$4,208 \times 606$

$3,068 \times 523$

+ $430 \times 3,064$

$3,007 \times 502$

$254 \times 6,104$

- ✘ When multiplying 1,729 times 308, Clayton got a product of 53,253. Without calculating, does his product seem reasonable? Explain your thinking.
- ✘ A publisher prints 1,912 copies of a book in each print run. If they print 305 runs, the manager wants to know about how many books will be printed. What's a reasonable estimate.

HOMEWORK
